

Psychological Effects of Wildfires

Abstracts from the PILOTS Database

[PILOTS ID #]

- Birmes, Philippe J; Brunet, Alain; Coppin-Calmes, Dominique; Arbus, Christophe; Coppin, Dominique; Charlet, Jean-Paul; Vinnemann, Nathalie; Juchet, Henri; Lauque, Dominique; Schmitt, Laurent.** *Symptoms of peritraumatic and acute traumatic stress among victims of an industrial disaster.* Psychiatric Services 56(1): 93-95. January 2005. [26992]

Previous studies have examined peritraumatic distress, peritraumatic dissociation, and acute stress disorder as predictors of PTSD. The authors examined whether these 3 predictors were associated with PTSD symptoms when considered simultaneously. 200 victims of a factory explosion in Toulouse, France, were surveyed 2 and 6 months after the event with use of retrospective self-reports of peritraumatic distress, peritraumatic dissociation, and acute stress disorder. A hierarchical multiple regression predicting PTSD symptoms 6 months posttrauma indicated that all 3 constructs explained unique variance, accounting for up to 62%. Peritraumatic distress and dissociation and acute stress disorder appear conceptually different from one another and show promise in identifying who is at risk of PTSD. [Author Abstract]
- Bramsen, Inge; Van der Ploeg, Henk M; Boers, Maarten.** *Posttraumatic stress in aging World War II survivors after a fireworks disaster: a controlled prospective study.* Journal of Traumatic Stress 19(2): 291-300. April 2006. [19839]

Little is known about the effects of cumulative trauma and whether traumatized individuals are more vulnerable. In 2000, a fireworks disaster created the possibility to examine this issue among World War II survivors who were part of an ongoing longitudinal study. Between 1998 and 2000 posttraumatic stress increased in disaster exposed respondents as opposed to the control group. War-related reexperiencing and avoidance also increased. The strongest increase occurred in disaster-exposed respondents who had low levels of wartime stress and a slight decrease occurred in those who had high wartime exposure. This unique controlled observation suggests that disasters do increase the levels of posttraumatic stress, and that reactivation of previous traumatic events generally occurs. However, the vulnerability hypothesis was not supported. [Author Abstract]
- Clayer, John R; Bookless-Pratz, Claire; Harris, Rita L.** *Some health consequences of a natural disaster.* Medical Journal of Australia 143(5): 182-184. September 2, 1985. [24298]

A survey of the health and psychosocial problems of all victims of the 1983 South Australian Ash Wednesday Bushfires was carried out 12 months after the disaster. A total of 1526 victims completed an extensive questionnaire that included the 28-item General Health Questionnaire and a self-reporting check-list of specific health problems. The data received indicated a significant increase in stress-related conditions, including hypertension, gastrointestinal disorders, diabetes, and mental illness, while the prevalence of nonstress-related conditions such as cancer or urological disease were not increased significantly. Health problems increased during the 12 months following the bushfire and diminished toward the end of that period, but a large number of difficulties remained. Certain disaster experiences, particularly the type of loss suffered, were found to be significantly related to health. [Author Abstract]
- Godeau, Emmanuelle; Vignes, Céline; Navarro, Félix; Iachan, Ronaldo; Ross, Jim; Pasquier, Colin; Guinard, Anne.** *Effects of a large-scale industrial disaster on rates of symptoms consistent with posttraumatic stress disorders among schoolchildren in Toulouse.* Archives of Pediatrics and Adolescent Medicine 159(6): 579-584. June 2005. [27493]

BACKGROUND: PTSD has been studied largely among adults and in the context of

intentional, collective experiences such as war and terrorism. Far less is known about PTSD among adolescents and resulting from massive industrial accidents. Such an accident in Toulouse, France, 10 days after the World Trade Center disaster, provided an opportunity to examine its effects among adolescents already sensitized by media coverage of the World Trade Center disaster.

OBJECTIVES: (1) To assess the presence of symptoms consistent with PTSD (SCW-PTSD) among adolescents in Toulouse after a massive industrial accident, (2) to determine the "excess" of SCW-PTSD among those directly exposed vs those nondirectly exposed, and (3) to examine dosage effects for exposure and the cumulative effect on PTSD of accident-related experiences.

DESIGN, SETTING and PARTICIPANTS: A survey containing questions on exposure and SCW-PTSD was administered to students aged 11 years, 13 years, 15 years, and 17 years who were enrolled in randomly selected, grade-stratified classrooms from schools for directly exposed students (n = 577) in Toulouse and nondirectly exposed students (n = 900) in the region.

MAIN OUTCOME MEASURE: The prevalence of SCW-PTSD among directly exposed and nondirectly exposed students.

RESULTS: 9 months after the industrial accident, 44.6% of 11- and 13-year-old directly exposed students and 28.5% of 15- and 17-year-old directly exposed students still showed SCW-PTSD, compared with 22.1% of 11- and 13-year-old nondirectly exposed students and 4.4% of 15-year-old nondirectly exposed students. Among 11- and 13-year-olds, the likelihood of having SCW-PTSD was higher for girls who were enrolled in elementary schools, were personally injured, and had severe damage at home, as opposed to boys who were high-school students without severe damage at home or personal injury. Among the 15- and 17-year-olds, being a girl, 17 years old, and personally injured increased the likelihood of having SCW-PTSD, as opposed to 15-year-old boys who were not injured. The effects of injuries were cumulative: students injured personally and with an injured family member were more likely to have SCW-PTSD than those experiencing either personal or family injury but not both. Excess of SCW-PTSD attributable to direct exposure was 50.5% for 11-year-olds, 49.3% for 13-year-olds, and 73.5% for 15-year-olds.

CONCLUSIONS: A substantial proportion of Toulouse adolescents still had SCW-PTSD 9 months after the accident. Directly exposed students were far more likely to show SCW-PTSD than those nondirectly exposed, but both groups had SCW-PTSD at rates that were higher than expected. The symptoms were associated with demographic characteristics and direct experiences of trauma. Higher rates applied to students who were personally injured with injured family members and severe damage at home. Students with these characteristics predictive of SCW-PTSD should be given prompt attention to avoid long-lasting effects. [Author Abstract]

5. **Holman, E Alison; Silver, Roxane Cohen.** *Getting "stuck" in the past: temporal orientation and coping with trauma.* Journal of Personality and Social Psychology 74(5): 1146-1163. May 1998. [09669]

The relations between temporal orientation and long-term psychological distress were studied cross-sectionally and longitudinally in 3 samples of traumatized individuals: adult victims of childhood incest, Vietnam War veterans, and residents of 2 southern California communities devastated by fire. Results indicated that a past temporal orientation -- focusing attention on prior life experiences -- was associated with elevated levels of distress long after the trauma had passed, even when controlling for the degree of rumination reported. Temporal disintegration at the time of the trauma -- whereby the present moment becomes isolated from the continuity of past and future time -- was associated with a high degree of past temporal orientation over time and subsequent distress. Temporal disintegration was highest among individuals who had experienced the most severe loss, had previously experienced chronic trauma, and had had their identities threatened by their traumatic experience. [Author Abstract]

6. **Jones, Russell T; Ribbe, David Paul; Cunningham, Phillippe Belton.** *Psychosocial correlates of fire disaster among children and adolescents.* Journal of Traumatic Stress 7(1): 117-122. January 1994. [11910]

This study examined the extent of children's and adolescents' psychosocial maladjustment

associated with a natural disaster, namely, wildfire. The course of psychopathology was assessed six weeks after a major wildfire destroyed 420 homes. Victims' functioning relative to a comparison group from the same community, matched for age, gender, socioeconomic status, and fire insurance was examined. The major goal of this study was to assess systematically the short-term mental health consequences of a wildfire disaster among children and adolescents. This goal was achieved through the use of standardized assessment procedures. The results of this study add useful information to the literature concerning the impact of disaster among children and adolescents and provide a methodological framework for future efforts in this area. [Author Abstract]

KEY WORDS: fire; child; adolescent; disaster; PTSD.

7. **Jones, Russell T; Ribbe, David Paul; Cunningham, Phillippe Belton; Weddle, J David.** *Psychosocial correlates of wildfire disaster: post disaster adult reactions.* Fire Technology 39(2): 103-117. April 2003. [30013]

Thirty adults' psychosocial maladjustment associated with a wildfire were systematically examined, one and a half months after a major wildfire destroyed 420 homes. The level of psychopathology was determined through the use of standardized assessment instruments, including the Diagnostic Interview Schedule and the Impact of Events Scale. Victims' individual responses were evaluated, relative to a comparison group from the same community matched for age, gender socioeconomic status, and fire insurance. Increased levels of posttraumatic stress, depression, and anxiety symptoms were reported significantly more often among victims versus non-victims. Also, females more often reported greater levels of psychological symptoms than males. Parent status and previous disaster experience had no differential impact on victims' reactions. Implications are discussed in light of existing findings in this area of research. [Author Abstract]

KEY WORDS: fire; wildfire; adult; disaster; PTSD; trauma

8. **Jones, Russell T; Ribbe, David Paul; Cunningham, Phillippe Belton; Weddle, J David; Langley, Audra Kae.** *Psychological impact of fire disaster on children and their parents.* Behavior Modification 26(2): 163-186. April 2002. [24876]

Six weeks following a major wildfire, children's psychosocial functioning was examined. Employing a multimethod assessment approach, the short-term mental health consequences of the fire were evaluated. Individual adjustment was compared between families who reported high levels of loss as a result of the fire (high-loss group) and families who reported relatively low levels of loss resulting from the fire (low-loss group). Standardized assessment procedures were employed for children and adolescents as well as their parents. In general, high-loss participants reported slightly higher levels of PTSD symptoms and significantly higher scores on the Impact of Events Scale. PTSD symptoms reported by parents were generally significantly correlated with (but not concordant with) PTSD symptoms reported by their children. The high-loss group scored significantly higher on the Resource Loss Index than did the low-loss group. Preexisting and comorbid disorders and previous stressors are described. A methodological framework for future studies in this area is discussed. [Author Abstract]

9. **Koopman, Cheryl; Classen, Catherine C; Spiegel, David.** *Dissociative responses in the immediate aftermath of the Oakland/Berkeley firestorm.* Journal of Traumatic Stress 9(3): 521-540. July 1996. [13207]

This study examined relationships between dissociative symptoms experienced in the immediate aftermath of the Oakland/Berkeley firestorm and contact with the fire, life events, demographic variables, and actions taken after learning about the fire. 187 participants completed self-report measures about their experiences during and immediately following the fire. Dissociative symptoms were significantly related to contact with the fire, sex, and stressful life events. Also, dissociative symptoms were significantly related to engaging in certain activities,

such as trying to get closer to the fire and going into blocked-off areas and crossing police barricades. These results suggest that dissociative symptoms may merit special attention in intervention focusing on the immediate aftermath of disaster. [Author Abstract]

KEY WORDS: Dissociation; disaster; fire; acute; stress.

10. **Langley, Audra Kae; Jones, Russell T.** *Coping efforts and efficacy, acculturation, and post-traumatic symptomatology in adolescents following wildfire*. *Fire Technology* 41(2): 125-143. April 2005. [27620]

Recent studies of children and adolescents who have experienced a residential, industrial, or wild fire have suggested a causal link between fire disaster and PTSD related psychological distress. Not everyone, however, is equally affected by the stress of experiencing such an event, and the role of coping in this process may be an important mediating factor. Additionally, several studies have found that girls and African Americans report more distress following disasters than do boys and Caucasians. The current study sought to investigate the roles of exposure/loss, coping efficacy, and coping strategy in mediating psychological distress in adolescents after a disaster.

The current study included a representative sample of 206 9th graders from a Central Florida High School affected by severe wildfires who were assessed via self-report measures 3- and 10-months after the fires, to assess the explanatory roles of exposure/loss, coping efficacy, and coping strategy on PTSD. Moreover, acculturation level and SES were included along with gender and ethnicity in testing for the moderating role of sociodemographics.

Results indicated an important role for exposure/loss, coping efficacy, and coping strategy as they related to PTSD symptomatology in adolescents at both Time 1 and Time 2. Finally, although relationships between the proposed variables and PTSD did not interact with gender, acculturation, SES, or ethnicity, there was a significant interaction between acculturation and ethnicity signifying that for African American youth, high acculturation levels were predictive of less PTSD symptomatology. [Author Abstract]

KEY WORDS: PTSD; adolescents; coping; self efficacy; acculturation

11. **Marshall, Grant N; Schell, Terry L; Elliott, Marc N; Rayburn, Nadine Recker; Jaycox, Lisa H.** *Psychiatric disorders among adults seeking emergency disaster assistance after a wildland-urban interface fire*. *Psychiatric Services* 58(4): 509-514. April 2007. [29396]

OBJECTIVE: This study estimated the prevalence of psychopathology at a three-month follow-up among persons seeking emergency relief services after a wildfire and identified a practical screener for use in these disaster assistance settings to aid early identification of persons at risk of subsequent psychopathology.

METHODS: During the October 2003 California firestorm that occurred at the wildland-urban interface, 357 persons who were seeking assistance from adjacent American Red Cross and government relief centers were recruited for this study. Within days of mandatory evacuation, participants completed baseline self-administered questionnaires assessing demographic characteristics, initial subjective reactions, and degree of fire exposure. At the three-month follow-up, symptoms of PTSD and major depression were measured via a mailed survey.

RESULTS: At follow-up 33% showed evidence of probable major depression; 24% exhibited probable PTSD. On a bivariate basis, 7 initial reaction and fire exposure items were significantly associated with subsequent psychopathology. Best-subsets logistic regression analyses revealed that property damage and physical injury were the best multivariate predictors of psychopathology at follow-up. No additional items provided a significant incremental improvement in prediction.

CONCLUSIONS: Individuals seeking immediate emergency assistance related to the wildland-urban interface fire were at elevated risk of psychopathology in the weeks after the fire. A short, easily administered, two-item screener, composed of items assessing fire exposure severity, appears to hold promise for aiding early identification of persons at risk of postfire psychopathology. These findings may also have implications for other mass disasters. [Author Abstract]

12. **McDermott, Brett M; Lee, Erica M; Judd, Marianne; Gibbon, Peter.** *Posttraumatic stress disorder and general psychopathology in children and adolescents following a wildfire disaster.* Canadian Journal of Psychiatry 50(3): 137-143. March 2005. [27711]
OBJECTIVE: To report on the use of the Post Traumatic Stress Disorder Reaction Index (PTSD-RI) and the Strengths and Difficulties Questionnaire (SDQ) in identifying children and adolescents who may require psychological interventions following exposure to a wildfire disaster.
METHOD: Six months after a wildfire disaster, we conducted a school-based program to screen for wildfire-related events, such as exposure to and perception of threat, PTSD, and general psychopathology.
RESULTS: The screening battery was completed by 222 children (mean age 12.5 years, SD 2.48; range 8 to 18 years). Severe or very severe PTSD was reported by 9.0% of students, while 22.6% scored in the abnormal range on the Emotional Symptoms subscale of the SDQ. Younger children and individuals with greater exposure to and perception of threat experienced higher levels of PTSD and general psychopathology. Female students reported a greater perception of threat but did not report higher levels of PTSD or other symptoms.
CONCLUSIONS: Screening was well received by students, parents, and staff and proved feasible in the postdisaster environment. The PTSD-RI and SDQ demonstrated different individual risk associations and functioned as complementary measures within the screening battery. The identification of children at greatest risk of mental health morbidity enabled service providers to selectively target limited mental health resources. [Author Abstract]
KEY WORDS: children, adolescents, PTSD, psychopathology, selective intervention

13. **McFarlane, Alexander Cowell.** *Posttraumatic phenomena in a longitudinal study of children following a natural disaster.* Journal of the American Academy of Child and Adolescent Psychiatry 26(5): 764-769. September 1987. [01655]
This longitudinal study examined the prevalence of posttraumatic phenomena and how they relate to symptomatic and behavioral disorders in a population of schoolchildren exposed to an Australian bushfire disaster. The prevalence of these phenomena did not change over an 18-month period, suggesting that they were markers of significant developmental trauma. The mothers' responses to the disaster were better predictors of the presence of posttraumatic phenomena in children than the children's direct exposure to the disaster. Both the experience of intrusive memories by the mothers and a changed pattern of parenting seemed to account for this relationship. [Author Abstract]
KEY WORDS: posttraumatic disorders; disasters; parenting; life events stress; imagery

14. **McFarlane, Alexander Cowell.** *The aetiology of post-traumatic morbidity: predisposing, precipitating and perpetuating factors.* British Journal of Psychiatry 154: 221-228. February 1989. [01074]
A group of 469 firefighters were studied 4, 11 and 29 months after having an extreme exposure to a bushfire disaster. The relative importance of the impact of the disaster, personality and ways of coping were investigated as determinants of post-traumatic morbidity. Neuroticism and a past history of treatment for a psychological disorder were better predictors of post-traumatic morbidity than the degree of exposure to the disaster or the losses sustained. These results raise doubts about the postulated central aetiological role a traumatic event plays in the onset of morbidity. [Author Abstract]

15. **McFarlane, Alexander Cowell; Papay, Peter.** *Multiple diagnoses in posttraumatic stress disorder in the victims of a natural disaster.* Journal of Nervous and Mental Disease 180(8): 498-504. August 1992. [03365]
A population of the fire fighters who had been exposed to a natural disaster were screened using the General Health Questionnaire 4, 11, and 29 months after a natural disaster. On the

basis of these data, a high-risk group of subjects who had scored as cases and probable cases and a symptom-free comparison group were interviewed using the Diagnostic Interview Schedule 42 months after the disaster. The prevalence of PTSD, affective disorders, and anxiety disorders was examined. Only 23% of the 70 subjects who had developed a PTSD did not attract a further diagnosis, with major depression being the most common concurrent disorder. Comorbidity appeared to be an important predictor of chronic PTSD, especially with panic disorder and phobic disorders. The subjects who had only a PTSD appeared to have had the highest exposure to the disaster. Adversity experienced both before and after the disaster influenced the onset of both anxiety and affective disorders. [Author Abstract]

16. **Morren, Mattijn; Yzermans, C Joris; Van Nispen, Ruth M A; Wevers, Stephan J M.** *The health of volunteer firefighters three years after a technological disaster.* Journal of Occupational Health 47(6): 523-532. November 2005. [29085]

On May 13, 2000, a fireworks depot exploded in a residential area of the city of Enschede, The Netherlands. Many disaster workers responded, including volunteer firefighters, a group that has received little attention in disaster research. This study examined the presence of health problems in volunteer firefighters who were involved in disaster work, three years after the disaster. Furthermore, it was investigated whether demographic characteristics and disaster exposure predicted health problems. The study population consisted of 246 volunteer firefighters who were deployed in disaster work and 71 non-deployed controls. These firefighters completed a questionnaire which inquired about their perceived health and health change, physical symptoms, post-traumatic stress, mental health problems, and health care utilization. Three years after the disaster, no health differences emerged between deployed and non-deployed firefighters. Good health and health improvement over the previous year were reported. Respondents who encountered more distressing experiences during disaster work or carried out more direct disaster-related recovery tasks reported more mental health problems and health care utilization. However, the most reliable predictors of health problems were distressing experiences unrelated to the disaster in personal life or during work. Three years after the disaster, the health of volunteer firefighters involved in the disaster work was not much impaired, possibly because aftercare was available and utilized. Nevertheless, disaster exposure was associated with elevated post-traumatic stress symptoms and mental health care utilization. Health care workers should direct specific attention to the treatment and prevention of post-traumatic stress symptoms in cases of major accidents or disasters. [Author Abstract]

KEY WORDS: disasters; rescue work; volunteer firefighters; occupational exposure; psychological problems; physical symptoms; The Netherlands

17. **Parslow, Ruth A; Jorm, Anthony F; Christensen, Helen.** *Associations of pre-trauma attributes and trauma exposure with screening positive for PTSD: analysis of a community-based study of 2085 young adults.* Psychological Medicine 36(3): 387-395. March 2006. [30011]

BACKGROUND: While pre-trauma personality and mental health measures are risk factors for post-traumatic stress disorder (PTSD), such information is usually obtained following the trauma and can be influenced by post-trauma distress. We used data collected from a community-based survey of young adults before and after a major natural disaster to examine the extent to which participants' traumatic experiences, demographic and pre-trauma risk factors were associated with their screening positive for PTSD when re-interviewed.

METHOD: A representative selection of 2085 young adults from the Australian Capital Territory and environs, interviewed in 1999 as part of a longitudinal community-based survey, were re-interviewed 3–18 months after a major bushfire had occurred in the region. When re-interviewed, they were asked about their experiences of trauma threat, uncontrollable and controllable traumatic experiences and their reaction to the fire. They were also screened for symptoms of fire-related PTSD experienced in the week prior to interview.

RESULTS: Four-fifths of participants were exposed to the trauma with around 50% reporting having experienced uncontrollable traumatic events. Reporting PTSD symptoms was associated with being female, having less education, poorer mental health and higher levels of neuroticism

prior to the trauma. Particular fire experiences, including being evacuated and feeling very distressed during the disaster, were more strongly associated with PTSD symptoms compared with pre-trauma measures.

CONCLUSIONS: While demographic and pre-trauma mental health increased the likelihood of reporting PTSD symptoms, exposure to trauma threat and reaction to the trauma made greater contributions in explaining such symptoms as a result of this disaster. [Author Abstract]

18. **Van den Berg, Bellis; Grievink, Linda; Stellato, Rebecca K; Yzermans, C Joris; Lebret, Erik.** *Symptoms and related functioning in a traumatized community.* Archives of Internal Medicine 165(20): 2402-2407. 14 November 2005. [29088]

BACKGROUND: Traumatic events are described as precipitating factors for medically unexplained symptoms. The aim of this study was to examine the prevalence and course of symptoms reported by disaster survivors and to assess whether the symptoms have features similar to those of medically unexplained symptoms.

METHODS: A 3-wave longitudinal study was performed after an explosion of a fireworks depot. As a result of the explosion, 23 people were killed, more than 900 people were injured, and about 500 homes were damaged or destroyed. Respondents completed a set of validated questionnaires measuring their health problems 3 weeks (wave 1), 18 months (wave 2), and 4 years (wave 3) after the disaster. A comparison group was included at waves 2 and 3.

RESULTS: The study population included 815 survivors who participated in the 3 waves. The mean number of symptoms was higher among survivors compared with control subjects at wave 2 (7.5 vs 5.8 symptoms) and at wave 3 (6.1 vs 4.9 symptoms) ($P < .001$ for both). Survivors and control subjects with more symptoms reported significantly lower mean scores on all scales of the Dutch version of the RAND 36-item health survey. Illness behavior and depression and anxiety were associated with the number of symptoms. For example, more than 60% of survivors with 10 or more symptoms reported depression and anxiety, compared with 2.4% of survivors with 0 to 1 symptoms ($P < .001$).

CONCLUSIONS: Up to 4 years after the disaster, symptoms were more prevalent among survivors than controls. Although medical disorders cannot be excluded, the reported symptoms showed several features similar to those of medically unexplained symptoms in the general population. [Author Abstract]

19. **Van den Berg, Bellis; Van der Velden, Peter G; Yzermans, C Joris; Stellato, Rebecca K; Grievink, Linda.** *Health-related quality of life and mental health problems after a disaster: are chronically ill survivors more vulnerable to health problems?* Quality of Life Research 15(10): 1571-1576. December 2006. [29090]

Studies have shown that the chronically ill are at higher risk for reduced health-related quality of life (HRQL) and for mental health problems. A combination with traumatic events might increase this risk. This longitudinal study among 1216 survivors of a disaster examines whether chronically ill survivors had a different course of HRQL and mental health problems compared to survivors without chronic diseases. HRQL and mental health problems were measured 3 weeks, 18 months, and 4 years post-disaster. Data on pre-disaster chronic diseases was obtained from the electronic medical records of general practitioners. Random coefficient analyses showed significant interaction effects for social functioning, bodily pain, and emotional role limitations at T2 only. Chronically ill survivors did not consistently have a different course of general health, physical role limitations, and mental health problems. In conclusion, chronic diseases were not an important risk factor for impaired HRQL and mental health problems among survivors. [Author Abstract]

KEY WORDS: chronic diseases; disasters; longitudinal studies; mental health; quality of life; risk factors

20. **Van der Velden, Peter G; Christiaanse, Berdi B A; Kleber, Rolf J; Marcelissen, Frans G H;**

Dorresteyjn, Sasja A M; Drogendijk, Annelieke N; Roskam, Albert-Jan R; Grievink, Linda; Gersons, Berthold P R; Olf, Miranda; Meewisse, Marie-Louise. *The effects of disaster exposure and post-disaster critical incidents on intrusions, avoidance reactions and health problems among firefighters: a comparative study.* Stress, Trauma, and Crisis 9(2): 73-93. April-June 2006. [29091]

Firefighters are at risk to be confronted with critical incidents and disasters. This study focused on the predictive value of these variables and their interaction effect for intrusions, avoidance reactions, and health problems among firefighters 18 months post-disaster (N = 639). Furthermore, the course of intrusions, avoidance reactions, and health problems in the period 2-3 weeks to 18 months post-disaster was assessed. Health problems were compared with those of non-affected firefighters (N = 132). Results showed that only disaster exposure and critical incidents accounted for a significant but small proportion of the variance ($R^2 < .07$) of intrusions, avoidance reactions, and health problems among the affected firefighters. Health problems among affected firefighters did not decline in the period 2-3 weeks to 18 months post-disaster, in contrast to intrusions and avoidance reactions. Health problems of both groups were comparable at T2. Results suggest that resilience in firefighters is rather high. [Author Abstract]

KEY WORDS: comparative; critical incidents; disaster; firefighters; health problems; intrusions and avoidance reactions; longitudinal; resilience

21. **Van der Velden, Peter G; Grievink, Linda; Kleber, Rolf J; Drogendijk, Annelieke N; Roskam, Albert-Jan R; Marcelissen, Frans H G; Olf, Miranda; Meewisse, Marie-Louise; Gersons, Berthold P R.** *Post-disaster mental health problems and the utilization of mental health services: a four-year longitudinal comparative study.* Administration and Policy in Mental Health and Mental Health Services Research 33(3): 279-288. May 2006. [27900]

This study examined mental health problems and mental health services (MHS) utilization after a fireworks disaster among adult survivors and a comparison group. The disaster took place on May 13, 2000, in the city of Enschede, the Netherlands. Victims (N = 662) participated in a survey 2-3 weeks (T1), 18 months (T2), and 4 years (T3) post-disaster. The comparison group consisted of non-affected people from another city (N = 526). They participated at T2 and T3. Victims used MHS more often than the comparison group in the 12-month period before T2 and T3 (OR 3.9 and 2.4). Victims with severe depression and anxiety symptoms at T2 used MHS more often than participants in the comparison group with these symptoms (OR 2.6 and 2.0). After 4 years, MHS utilization among participants in both groups with anxiety symptoms did not differ, suggesting attenuation of the observed effects. Results suggest that after a disaster survivors with mental health problems are less reluctant to use MHS than under normal circumstances. [Author Abstract]

KEY WORDS: anxiety; depression; disaster; mental health services; PTSD

22. **Van der Velden, Peter G; Grievink, Linda; Olf, Miranda; Gersons, Berthold P R; Kleber, Rolf J.** *Smoking as a risk factor for mental health disturbances after a disaster: a prospective comparative study.* Journal of Clinical Psychiatry 68(1): 87-92. January 2007. [29092]

OBJECTIVE: To assess whether smoking is a(n) (independent) risk factor for mental health problems among adult disaster victims and among a non-exposed comparison group.

METHOD: Surveys were conducted 18 months (T1) and 4 years (T2) after a fireworks disaster in Enschede, The Netherlands (May 13, 2000), among adult victims (N = 612) and a comparison group (N = 526) of residents of a city located in another part of the Netherlands. The surveys included measures of smoking (Dutch Local and National Public Health Monitor); severe anxiety, depression, and hostility symptoms (the Symptom Checklist-90, revised); and disaster-related PTSD (DSM-IV criteria) (the PTSD self rating scale).

RESULTS: Victims who smoked at T1 had a higher chance to suffer from severe anxiety symptoms (adjusted OR = 2.32 [95% CI = 1.19 to 4.53]), severe hostility symptoms (adjusted OR = 1.84 [95% CI = 1.06 to 3.22]), and disaster-related PTSD (adjusted OR = 2.64 [95% CI = 1.05 to 6.62]) at T2 than victims who did not smoke at T1, when controlling for symptoms at T1, demographic characteristics, and life events. Among the total comparison group, smoking was

not an independent risk factor. However, smoking at T1 was associated with severe anxiety symptoms at T2 among controls who were confronted with stressful life events (adjusted OR = 4.11 [95% CI = 1.03 to 16.47]).

CONCLUSIONS: Smoking is an independent risk factor for severe anxiety and hostility symptoms and PTSD among adult people who are confronted with stressful life events. Questions about smoking behavior among disaster victims may help to identify adult victims who are at risk for post event mental health disturbances. [Author Abstract]

23. **Van der Velden, Peter G; Kleber, Rolf J; Christiaanse, Berdi B A; Gersons, Berthold P R; Marcelissen, Frans H G; Drogendijk, Annelieke N; Grievink, Linda; Olf, Miranda; Meewisse, Marie-Louise.** *The independent predictive value of peritraumatic dissociation for postdisaster intrusions, avoidance reactions, and PTSD symptom severity: a 4-year prospective study.* Journal of Traumatic Stress 19(4): 493-506. August 2006. [80155]

This 4-year prospective study (N = 662) of victims of a fireworks disaster examines the independent predictive value of peritraumatic dissociation for self-reported intrusions, avoidance reactions, and PTSD symptom severity at both 18-months (T2) and almost 4-years postdisaster (T3). Peritraumatic dissociation was measured 2-3 weeks after the disaster (T1). Hierarchical multiple regression analyses revealed that peritraumatic dissociation was not a strong independent predictor for intrusions and avoidance reactions and PTSD symptom severity at T2 or at T3 above initial intrusions, avoidance reactions, and psychological distress (T1). Results suggest that an early screening procedure for peritraumatic dissociation, which is aimed at identifying disaster victims who are at risk for long-term psychological disturbances can be omitted. [Author Abstract]

24. **Van der Velden, Peter G; Kleber, Rolf J; Fournier, Marijda; Grievink, Linda; Drogendijk, Annelieke N; Gersons, Berthold P R.** *The association between dispositional optimism and mental health problems among disaster victims and a comparison group: a prospective study.* Journal of Affective Disorders 102(1-3): 35-45. September 2007. [29093]

BACKGROUND: It is unclear whether the associations between the level of dispositional optimism on the one hand, and depression symptoms and other health problems on the other hand, among disaster victims differ from the associations among non-affected residents.

METHODS: To assess the associations between the level of dispositional optimism and health problems among disaster victims and non-affected residents, data of the longitudinal Enschede Fireworks Disaster Study was analyzed. Participants in the present study consisted of adult native Dutch victims of the disaster (N = 662) and a non-affected comparison group (N = 526). Both groups participated 18 months (T1) and almost 4 years post-disaster (T2). Multivariate logistic regression analyses were applied to examine the association between optimism and health problems among both groups.

RESULTS: Results showed that pessimistic victims were more at risk for severe depression symptoms and obsessive-compulsive symptoms than optimistic victims when controlling for demographic characteristics, life events, smoking, and existing health problems at T1. However, pessimistic participants in the comparison group were also more at risk for severe anxiety symptoms, sleeping problems, somatic problems, and problems in social functioning than optimistic control participants.

LIMITATIONS: We had no information on dispositional optimism before 18 months post-disaster.

CONCLUSIONS: Pessimists at baseline are more at risk for health problems after 27 months than optimists. However, among non-affected residents pessimism is a stronger independent risk factor than among victims. Results suggest that professional helpers such as general practitioners, psychologists, and psychiatrists should not rely too much on optimistic views of disaster victims. [Author Abstract]

KEY WORDS: anxiety; depression; disaster; dispositional optimism; prospective

25. **Van Kamp, Irene; Van der Velden, Peter G; Stellato, Rebecca K; Roorda, Jan; van Loon, Jeanne; Kleber, Rolf J; Gersons, Berthold P R; Lebet, Erik.** *Physical and mental health shortly after a disaster: first results from the Enschede firework disaster study.* European Journal of Public Health 16(3): 252-258. June 2006. [30012]

OBJECTIVES: Two to three weeks after the explosion of a fireworks storage facility in a residential area (May 2000, Enschede, The Netherlands) we assessed the self-reported physical and mental health among those affected by the disaster.

METHODS: A questionnaire survey was conducted among 3792 residents, passers-by, and rescue workers, who were involved in and/or affected by the disaster and were ≥ 18 years of age.

RESULTS: At least 30% of those affected by the disaster reported serious physical and mental health problems 2-3 weeks after the explosion. Compared with reference values in the general Dutch population, high scores were found for somatic symptoms, sleeping problems, and restrictions in daily functioning due to physical and mental problems, such as anxiety, depression, and feelings of insufficiency. The strength of these differences varied between groups, based on the level of involvement and the level of being affected.

CONCLUSIONS: Results indicate that the fireworks disaster had a substantial impact on the health of those affected by the disaster. The health impact was most pronounced for residents and passers-by and also for rescue workers living in the affected area, but to a lesser degree. Physical and mental health problems were strongly associated with the shocking experiences during and shortly after the disaster. [Author Abstract]

KEY WORDS: disaster; fireworks; physical and mental health; trauma

26. **Yzermans, C Joris; Donker, Gé A; Kerssens, Jan J; Dirkzwager, Anja Johanna Elisabeth; Soeteman, Rik J H; Ten Veen, Petra M H.** *Health problems of victims before and after disaster: a longitudinal study in general practice.* International Journal of Epidemiology 34(4): 820-826. August 2005. [28384]

BACKGROUND: We aimed to quantify the health problems and to assess the possible risk factors for developing health problems in persons affected by the explosion of a firework depot at Enschede, The Netherlands, on May 13, 2000. The explosion considerably damaged buildings in the local neighbourhood and caused 22 immediate deaths and injuries in over 1000 people.

METHODS: A longitudinal study of (89% of all) victims ($n = 9329$) and controls ($n = 7392$) with pre-disaster baseline morbidity for 16 months and post-disaster data for 2.5 years was conducted using the electronic medical records of general practitioners. Symptoms and diagnoses were recorded using the International Classification of Primary Care (ICPC). Prevalence rates for clusters of symptoms were compared between victim and control groups pre- and post-disaster. Risk factors for developing health problems were examined in hierarchical linear models.

RESULTS: Two and a half years post-disaster, the prevalence of psychological problems in victims who had to relocate was about double and in the non-relocated victims one-third more than controls. Victims with pre-disaster psychological problems were at a greater risk for post-disaster psychological problems. Relocated victims showed an excess of medically unexplained physical symptoms (MUPS) especially in a period of increased media attention. Both groups of victims showed some increase of gastrointestinal (GI) morbidity 2.5 years post-disaster compared with their pre-disaster rate, and compared with the control group.

CONCLUSIONS: Two and a half years post-disaster an excess of psychological problems, MUPS, and gastrointestinal morbidity was observed. Pre-disaster psychological problems and inevitable relocation were predictors of more post-disaster psychological problems. [Author Abstract]

KEY WORDS: disaster; general practice; longitudinal; health problems; psychological; baseline